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HERMETICALLY SEALED OPTICAL PLASTIC SUBSTRATE

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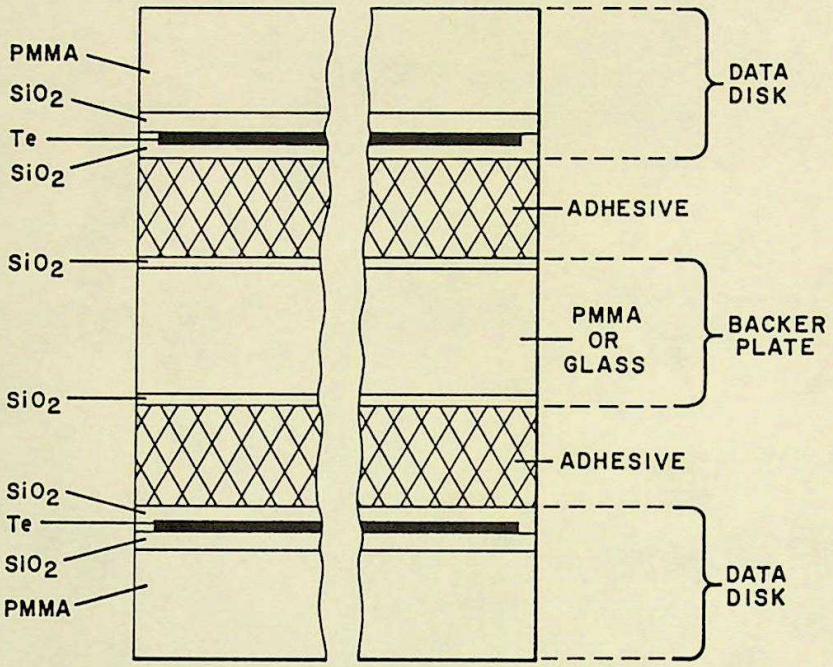

Two problems exist with prior art optical disks: (a) oxidation of the media and (b) disk radial runout. Thin films of SiO_2 and Al_2O_3 deposited over tellurium (Te), the writing medium, will eliminate both problems.

One such configuration may be seen in the figure. To obtain a very low cost media package, a plastic substrate, instead of glass may be used.

The "suitable adhesive" is a capillary filled transparent adhesive compatible with SiO_2 thin films and/or glass. Although PMMA is listed as the data disk substrate material, other inexpensive plastics can be used in its place. The backer plate can be PMMA coated on both sides with SiO_2 or it can be glass (preferably chemically strengthened glass with enhanced fracture resistance).

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The disk edges are coated during the SiO_2 depositions and masked during the tellurium depositions so the SiO_2 films completely surround the tellurium. Although the SiO_2 may contain pinholes, moisture and oxygen attack are impeded. The SiO_2 undercoating will also minimize attack via the PMMA surface.

In order to use this configuration, some changes in the optical components are required. First, a computer modeling must be done (for second surface ablation, the refractive indices and thicknesses of the composite PMMA/SiO_2 layers must be considered). Then the tropel objective must be designed and built.